Dawson College: **Linear Algebra** (SCIENCE): 201-NYC-05-S6: Fall 2015

Name: _____
Student ID: _____

Quiz 12

This quiz is graded out of 10 marks. No books, calculators, notes or cell phones are allowed. You must show all your work, the correct answer is worth 1 mark the remaining marks are given for the work. If you need more space for your answer use the back of the page.

Question 1. §4.4 #13 *(5 marks)* Show that $\{A_1, A_2, A_3, A_4\}$ is a basis for $\mathscr{M}_{2\times 2}$, and express A as a linear combination of the basis vectors.

$$A_1 = \begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix}, A_2 = \begin{bmatrix} 0 & 1 \\ 1 & 1 \end{bmatrix}, A_3 = \begin{bmatrix} 0 & 0 \\ 1 & 1 \end{bmatrix}, A_4 = \begin{bmatrix} 0 & 0 \\ 0 & 1 \end{bmatrix}, A = \begin{bmatrix} 1 & 0 \\ 1 & 0 \end{bmatrix}$$

Question 2. §4.5 #14 *(5 marks)* Let $\{\vec{v}_1, \vec{v}_2, \vec{v}_3\}$ be a basis for a vector space V. Show that $\{\vec{u}_1, \vec{u}_2, \vec{u}_3\}$ is also a basis, where $\vec{u}_1 = \vec{v}_1$, $\vec{u}_2 = \vec{v}_1 + \vec{v}_2$, and $\vec{u}_3 = \vec{v}_1 + \vec{v}_2 + \vec{v}_3$.